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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/803,615	03/18/2004	Hibiki Itoh	G110-040 CON	5877
21706	7590	02/16/2006	EXAMINER	
NOTARO AND MICHALOS 100 DUTCH HILL ROAD SUITE 110 ORANGEBURG, NY 10962-2100			WILLIAMS, SHERMANDA L	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 02/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/803,615

Applicant(s)

ITOH, HIBIKI

Examiner

Shermanda L. Williams

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

**UNIT CELL OF FLAT SOLID OXIDE FUEL CELL AND FUEL CELL STACK
COMPRISING THE SAME**

Examiner: Williams S.N. 10/803,615 Art Unit: 1745 January 30, 2006

Oath/Declaration

The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02. The oath or declaration is defective because: the parent case application 09/979,822 (now US 6,740,442) is not referenced on page 2 of the Declaration as well amendments submitted in the above identified application have not been referenced on page 1 of the Declaration.

Specification

The disclosure is objected to due the presence of the following informality: throughout the specification, there are typographical errors in the temperature unit expression. For an example, see page 29 line 5. Also in the first sentence of paragraph 15, the phrase "thin films each having a thickness of a several ten micron" is unclear. There is no approximate value that can be determined based on the given information. Correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 13 is rejected under 35 U.S.C. 112, first paragraph, as failing to meet the requirements of the written description. Claim 13 has subject matter that has not been fully disclosed in the specification in a manner that one having ordinary skill in the art at the time of the invention might clearly understand and make use of the claimed invention. The specification teaches that there is a first electrode member consisting of a porous substrate; an electrolyte film formed on any one of a front surface and a back surface of the first electrode member; a second electrode member formed on the electrolyte film; and a separator film formed on the other surface of the first electrode member. The specification does not disclose that there is "a first electrode member and a second electrode member...wherein at least one of said first electrode member and second electrode member is formed from a porous substrate" with an electrolyte sandwiched there between. It is disclosed that the first electrode member is formed by a porous substrate (paragraph 12). The second electrode member is not disclosed as a porous substrate. The discussion of the porous spacer and the second electrode being constructed from the same material is not supported. The second electrode is disclosed as being the other of a fuel electrode or the air electrode (paragraph 11). The spacer is disclosed as being formed of a porous substrate (paragraph 26). It was not disclosed as being a part of the second electrode member.

Claim Rejections - 35 USC § 102(b)

Claims 1-8, 11-13 are rejected under 35 USC 102(b) as being unpatentable over Poeppel et al. (US 4,476,196). Poeppel et al. discloses a solid oxide side fuel cell having monolithic cross flow core and manifold comprising the following:

an insulated core with thin layers of an electrolyte and intermediate film (or separator) material sandwiched between layers of porous anode and cathode electrodes respectively; See Claim 1, Column 4 Lines 52-61, Column 6 Line 20 to Column 7 Line 6, Column 8 Line 8 to Column 9 Line 5; The separator material in the current application (second sentence of paragraph 43) is disclosed as a strontium doped lanthanum chromite based oxide such as lanthanum chromite. The intermediate film material in the reference is lanthanum chromite (See Column 3 Line 17).

a core that has passageways for gas flow paths that are laid out in a crosswise or orthogonal pattern and has transverse manifolds for delivery and removal of reactant material;

with conductive web walls or conductive spacers between the individual cells and in the parallel and perpendicular direction respectively depending if it is an anode or cathode web wall See Column 7 Line 45 to Column 8 Line 7;

an electrolyte and separator material formed via the tape cast method (wetted process) for adhering to the anode and cathode electrode See Column 8 Line 8-17;

a ceramic paste is used to pack annular space to seal the structure and prevent gas leakage See Column 6 Lines 52-56;

Conductors or conductive jointing material that link the individual fuel cells See Column 7 Line 30;

a thin layer of electrolyte material **44** can be folded down on to the side or end portions **64** of the anode and cathode as seen in Figure 3, See Column 8 Line 64.

The reference teaches the use of anode, cathode, electrolyte, and separator materials that are matched as closely as possible to one another with respect to each coefficient of thermal expansion. See Column 9 Lines 25-40.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Poeppel et al. (US 4,476, 196) in view of Ketcham et al. (US. 6,045,935).

Poeppel et al. discloses a solid oxide fuel cell having monolithic cross flow core and manifolding. Poeppel et al. discloses all the limitations of claim 9 as discussed above except that the manifold structures or plates attached to the side surfaces of the laminated body are formed of a glass-ceramic (a type of ceramic). Ketcham et al. teaches that glass-ceramic is used for manifold in solid oxide fuel cells because the glass-ceramic closely matches the expansion properties of the electrolyte (see col. 3, line 65 to col. 4, line 14).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use glass-ceramic as the material of construction for the manifolds taught by Poeppel et al. because glass ceramic closely matches the expansion properties of the electrolyte in the solid oxide fuel cell stack. This will alleviate the loss of contact between the manifold and the surface of the laminate body thereby maintaining a proper seal.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Poeppel et al. (US 4,476, 196) in view of Ketcham et al. (US. 6,045,935) in combination with Moran Advanced Ceramics Datasheet for Glass Ceramic. The Morgan Advanced Ceramics Datasheet for Glass Ceramic states that one of the main advantages of glass ceramic is that it can be machined quickly and economically into complex shapes and precision parts using ordinary metal working tools. See www.morganadvancedceramics.com/materias/gc.htm The free-cutting property of the glass-ceramic is an inherent property. See MPEP 2112. The claiming of an inherent property is not patentable. See *In re Napier*, 55 F.3d 610, 613, 34 USPQ2d 1782, 1784 (Fed. Cir.1995) and *In re Grasselli*, 713 F.2d 731, 739, 218 USPQ 769, 775 (Fed. Cir. 1983).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory

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obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-3, 12, and 13 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,740,442. Although the conflicting claims are not identical, they are not patentably distinct from each other because of common subject matter, as follows: a flat solid oxide fuel cell

with a first electrode member consisting of a porous substrate, an electrolyte film on either the front or back surface, a separator film formed on the other surface of the first electrode, and a second electrode member formed on the electrolyte film. The first electrode member is a fuel electrode member or an air electrode and the second electrode member is the other of the fuel electrode or the air electrode. There is a seal portion covering all sides of the first electrode member functioning as a gas seal film. At least one part of the electrolyte or separator film comprises a seal that covers the entire area of side surfaces of one of two pairs of opposed side surfaces of first electrode member. The seal prevents gas from escaping.

As well the specification of the application in paragraph 12 teaches that the first electrode member being constructed of a porous substrate allows gas to pass through therefore it is a gas flow path. Due to the side seals of the fuel cell, it is the "sole" gas flow path. Likewise, in paragraph 18 of the specification it is taught that the presence of the electrolyte film, the separator film, and the seal portion does not allow the air or the fuel gas to wastefully leak out. Similarly in paragraph 19 of the specification it is taught that the corner film portion covers both end portions of one of the opposed side surfaces of the first electrode portion. The corner film seals a part between the end portions except a gas inflow/outflow opening.

Claim 1 of Patent 6,740,442 clearly encompasses the limitations of Claims 1-3 of application 10/803,615. Claims 1-3 of the application in view of the teachings of the specification of the application are not patentably distinct when compared with claim 1 of Patent 6,740,442. In claim 1 of '442 the seal includes a corner film portion, part of

the area between the corner films is a gas inflow/outflow opening, and the first electrode is identified as a gas flow path. The other limitations of claims 1-3 are clearly present in claim 1 and the specification of '442 as discussed above.

Claims 4 and 5 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 2 and 3 of U.S. Patent No. 6,740,442. Although the conflicting claims are not identical, they are not patentably distinct from each other because of common subject matter, as follows: dependent claim 4 of the application (dependent on claim 1 of the application) discloses that at least one of the electrolyte film or separator film is formed by a wet process relative to said first electrode member; dependent claim 5 of the application (dependent on claim 1 of the application) discloses a laminated body constituted by laminating single cells defined in claim 1. Dependent claims 2 and 3 of '422 (dependent on claim 1 of '422) clearly anticipate claims 4 and 5 of the application.

Claim 6 rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 4 of U.S. Patent No. 6,740,442. Although the conflicting claims are not identical, they are not patentably distinct from each other because of common subject matter, as follows: dependent claim 6 of the application (dependent on claim 5 which is dependent on claim 1) discloses a cell stack of a flat plate type solid oxide fuel cell having a spacer that is a porous substrate. Dependent claim 4 of '422 (dependent on claim 1 of '422) teaches a porous substrate spacer through which a fuel gas or air can fully pass. In paragraph 23 of the application specification, it is taught that gas can pass through the spacer.

Claims 7 and 8 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 5 and 6 of U.S. Patent No. 6,740,442. Although the conflicting claims are not identical, they are not patentably distinct from each other because of common subject matter, as follows: dependent claim 7 of the application (dependent on claim 6 of the application) discloses that the porous substrate consist of material that is the same as that of the second electrode member. Dependent claim 5 of '422 (dependent on claim 4 of '422) clearly anticipates claim 7 of the application, it discloses that the porous substrate consists of material that is the same as that of the second electrode member. Dependent claim 8 of the application (dependent on claim 5 of the application) discloses a conductive joint material provided between the spacer and separator film opposed each other in single cells that are adjacent each other. Claim 6 of '422 (dependent on claim 3 of '422) clearly anticipates claim 8 of the application, it discloses a conductive jointing material provided between the spacer and the separator film opposed to each other in single cells that are adjacent each other.

Claims 9 and 10 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 7 and 8 of U.S. Patent No. 6,740,442. Although the conflicting claims are not identical, they are not patentably distinct from each other because they are claiming common subject matter, as follows: dependent claim 9 of the application (dependent on claim 5 of the application) discloses a cell stack of a flat plate type solid oxide fuel cell having manifold plates formed of ceramics attached on side surfaces of the laminated body. Dependent claim 7 of '422

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(dependent on claim 3 of '422) clearly meets the limitations of claim 9 of the application in that it discloses a cell stack of a flat plate type solid oxide fuel cell having manifold plates formed of ceramics attached on side surfaces of the laminated body. Dependent claim 7 of '422 also teaches that a fuel gas and an air flow are supplied/exhausted via a fuel gas flow opening and an air flow opening provided to the manifold plates. In paragraph 72 of the application specification it is taught that a fuel gas flow opening and an air flow opening are formed to the manifold plate.

Dependent claim 10 of the application (dependent on claim 9 of the application) discloses that the ceramic material of the manifold plates of claim 9 is free-cutting glass ceramic. Dependent claim 8 of '422 (dependent on claim 7) discloses a cell stack of a flat plate type solid oxide fuel cell having free-cutting glass ceramics as the ceramic type for the manifold plates and that the gas flow opening and the air flow opening are bored after assemble of the cell stack. In paragraph 70 and 71 of the specification of the application it is taught that the fuel gas flow and the air flow openings are bored after the heat treatment of the assembled manifold plates and laminated body.

Claim 11 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 10 of U.S. Patent No. 6,740,442. Although the conflicting claims are not identical, they are not patentably distinct from each other because they are claiming common subject matter, as follows: dependent claim 11 of the application (dependent on claim 5 of the application) discloses that the lamination direction of the laminated body is set horizontal and the first electrode member and the spacer are orthogonally arranged. Dependent claim 10 of '422 (dependent on claim 3)

discloses that the lamination direction of the laminated body is set in the horizontal direction and each component of the laminated body is vertically arranged with the fuel gas and air flow in a vertical direction. In paragraphs 34 and 35 of the specification of the application it is disclosed that the lamination direction of the laminated body is horizontal and that the first electrode member and the spacer are arranged orthogonally (90 degrees or perpendicular or vertical to horizontal) to the lamination direction.

Conclusion

The following prior art was made of record but not relied upon. This prior art is considered pertinent to the applicant's disclosure: Iwata (US 5,589,286) discloses a solid electrolyte fuel cell, Ishihara et al. (US 5,185,219) discloses a solid oxide fuel cell, and Reichner (US 4,874,678) discloses an elongated solid electrolyte cell.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shermanda L. Williams whose telephone number is (272) 571-8915. The examiner can normally be reached on Mon.-Thurs. 7 AM - 4:30 PM and alternating Fridays 7 AM – 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (272) 571-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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SUPERVISORY PATENT EXAMINER